

Energy efficiency in sports and recreation buildings: managing energy

A Guide for Sports Centre Managers

Improvements in energy efficiency lead to:

- Substantial bottom-line savings on energy bills
- Increased comfort for customers and staff
- Reduced maintenance
- Green image, promoting good public relations



Institute of
Sport & Recreation
Management



Energy Efficiency
DEPARTMENT OF THE ENVIRONMENT

ARCHIVED DOCUMENT

BEST PRACTICE PROGRAMME

How to get started

INTRODUCTION

There are many good reasons why you and your staff should make reducing energy consumption a priority: you will save money, improve comfort, and benefit the environment. The objective of energy management is to achieve the desired environmental conditions at minimum cost. This Guide outlines how you set about implementing an effective energy management strategy. It explains the actions and roles essential for the strategy to produce short- and long-term benefits.

Saving energy is not just about technical and capital investment. It is also about motivating staff to adopt simple energy-saving habits (eg good housekeeping measures). If significant long-term reductions in energy use are to be achieved, every member of the sports centre staff needs to be actively involved in using energy more efficiently.

SENIOR MANAGEMENT COMMITMENT

The best way of achieving this is by showing commitment at the top. At all levels, staff will be more motivated if they know that their actions have the approval of top management.

The Department of the Environment (DOE) provides local authorities and private sector organisations with the opportunity to demonstrate a corporate commitment to energy efficiency through its Making a Corporate Commitment campaign.

ENERGY POLICY

If you want to grasp the energy issue and benefit fully from the substantial savings that are available at your centre you must establish an energy policy. This is a written document

Essential elements for effective energy management

- Senior management commitment
- Well-publicised energy policy and action plan
- Assignment of responsibility
- Staff motivation and training
- Ongoing monitoring
- Identifying opportunities for saving energy
- Cost-effective investment

supported by senior management, which outlines a strategy (both long- and short-term) for improving energy efficiency in your centre.

Your energy strategy will depend on individual situations – particularly on the 'corporate culture' of the organisation you are in, and on the stage it has reached in energy management. The strategy will also identify long- and short-term objectives, define staff roles and responsibilities, and contain an action plan.

Formulating a policy will help to ensure that an energy management strategy is less influenced by staff changes and becomes a long-term goal. DOE's General Information Report 12 contains a sample policy and it will help you review the current state of energy management in your organisation. The Report uses the 'Energy Management Matrix' with which you can make a formal assessment of key organisational aspects of energy management (see back page). A further Guide dealing specifically with developing energy policy is in preparation (GPG 186*).

ASSIGNMENT OF RESPONSIBILITY

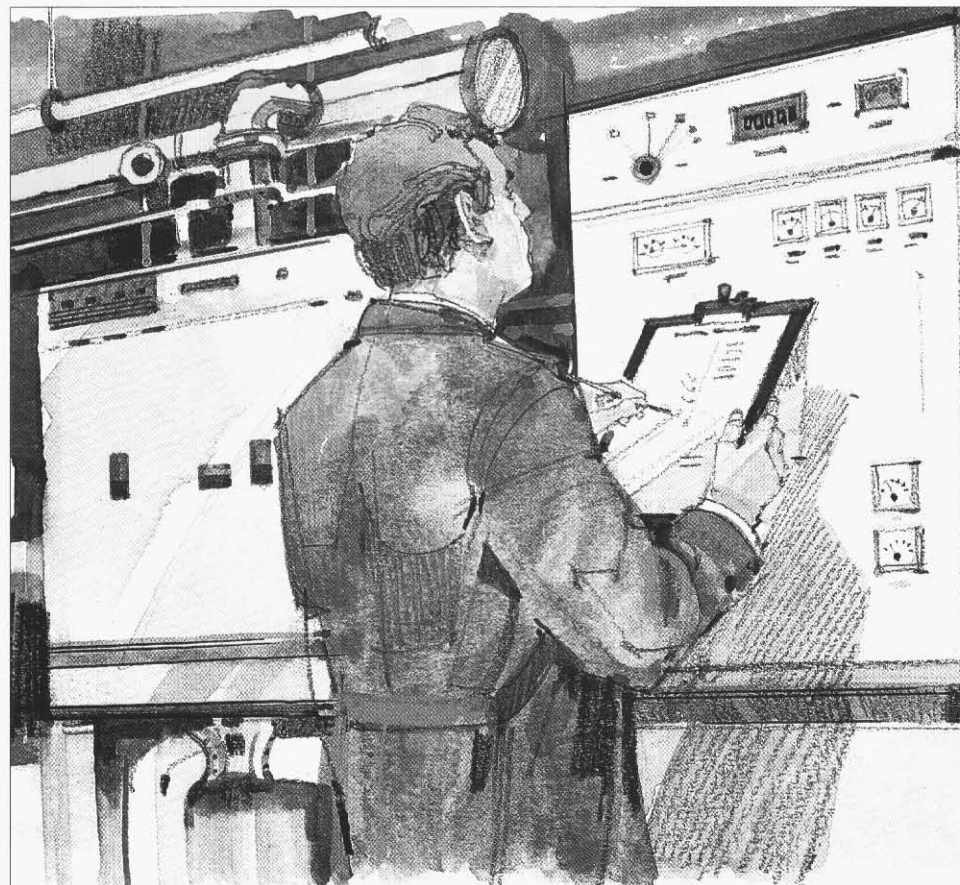
Once your centre has committed itself to managing energy, the next move is to assign responsibility for energy. Some of the tasks an energy manager has to perform are of a technical nature, such as analysing fuel consumption data and carrying out feasibility studies on new equipment.

Other tasks include, when necessary, effectively presenting the case for investment in new technology to senior management. Another key role is to motivate staff by reporting to them the effects of previous investment and initiatives. A training programme should be initiated so that all staff understand how they are expected to contribute to saving energy.

To find an existing member of staff who has the technical and inter-personal skills, and the enthusiasm, to complete these tasks may not be easy. Ideally the experience of an 'expert' should be sought. If your centre is owned by a local authority you may well have access to such a person, who may then take the role of energy manager of your centre.

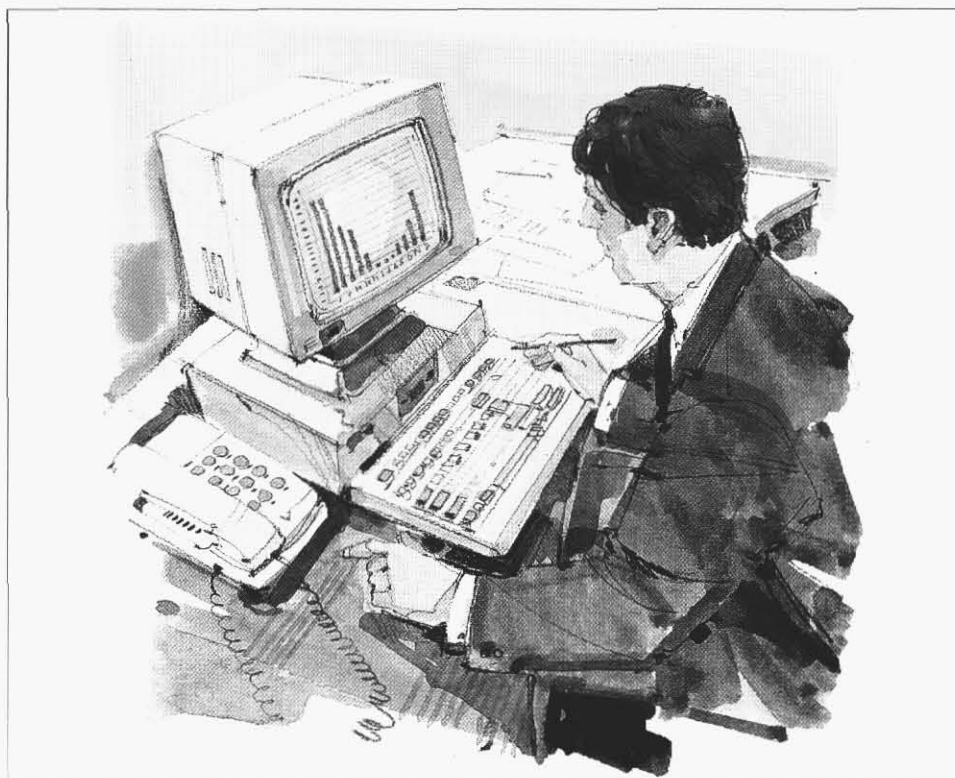
Larger leisure groups may have the resources to employ an energy manager with responsibility for a number of centres. Where such experts are not available within an organisation, the most likely candidate to take on the role will be the sports centre general manager.

Although the centre manager is likely to possess the interactive skills required by an energy manager, he/she may require help with the technical aspects and may need to use the experience of in-house staff or external experts.



An energy survey can help identify the opportunities for reducing energy costs

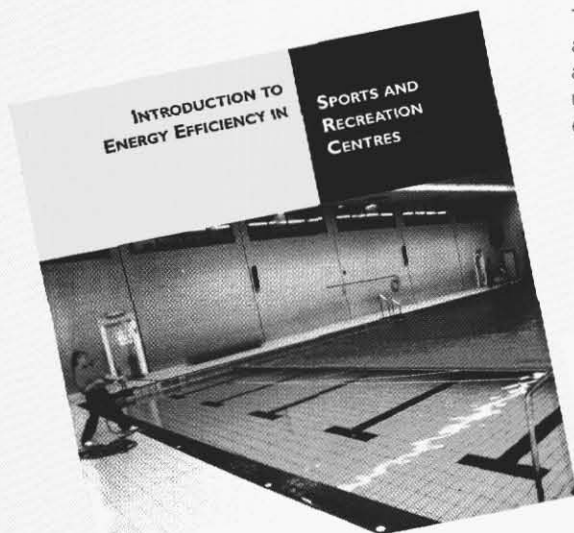
This Guide has shown you the essential steps you need to take to provide your business with long-term energy savings. Energy management requires firm commitment if it is to secure worthwhile benefits – financial and otherwise. Management must be sure that staff at all levels know their role and are properly motivated. Areas where energy is being wasted must be identified, and appropriate action determined. The importance of low-cost good housekeeping measures should not be overlooked. Objectives, roles and action plans should be set out in your energy policy. This will ensure that energy management remains an integral part of your business. There are hundreds of thousands of pounds worth of energy being wasted each year. Some of that money probably belongs to your centre.



Monitoring is crucial to knowing where energy is used

Introduction to Energy Efficiency in Sports and Recreation Centres (EEB7)

This Guide is intended for managers of sports, recreational and community centres, as well as for energy managers who are responsible for such facilities. It presents an overview of energy management, and suggests methods for assessing energy use, including calculation of Performance Indices, which can be compared with energy consumption yardsticks.



Energy Audits in Buildings (FEB 1B)

describes how an energy audit can be carried out. A series of outlined stages detail how energy savings can be made. The principal issues are outlined, and checklists show practical ways to reduce costs.



BEST PRACTICE PROGRAMME

Good housekeeping, maintenance and energy efficient technologies

Good housekeeping measures may include ensuring:

- lights and other equipment are not left on unnecessarily
- heating system time switches are set correctly
- equipment and controls are working properly, and fully maintained.

Good housekeeping initiatives are unlikely to succeed without the co-operation and motivation of staff members. Staff need to know what the aims of an energy management strategy are, how they are expected to participate, and how they will benefit from the savings made. This can be achieved by personal contact, circulated memos and literature, and poster campaigns. In order to maintain the momentum of your campaign, it is essential that progress is reported regularly.

Effective maintenance

An effective plant maintenance programme can avoid wasting thousands of pounds a year on fuel bills, and also minimises the risk of expensive breakdowns and related safety problems. It also helps managers make decisions on the need for replacement plant. Maintenance tasks required to keep plant

in peak running order are described for each of the main types of plant found in sports and recreation buildings, in Good Practice Guide 137.

Energy efficient technologies

If plant is performing poorly or fails, replacing it with energy efficient equipment makes good sense. Measures you may consider include:

- more efficient control systems
- low energy lights
- pool covers
- variable ventilation
- heat recovery
- modern efficient boiler systems
- condensing boilers
- combined heat and power (CHP)
- dehumidification heat pumps
- building energy management systems (BEMS).

These technologies are described more fully in Good Practice Guide 144. Efforts to reduce energy consumption are initially going to be most effective if they are aimed at the processes that consume most energy. Where

a centre has a swimming pool, heating the pool water and ventilating the pool hall are likely to be the major consumers of energy.

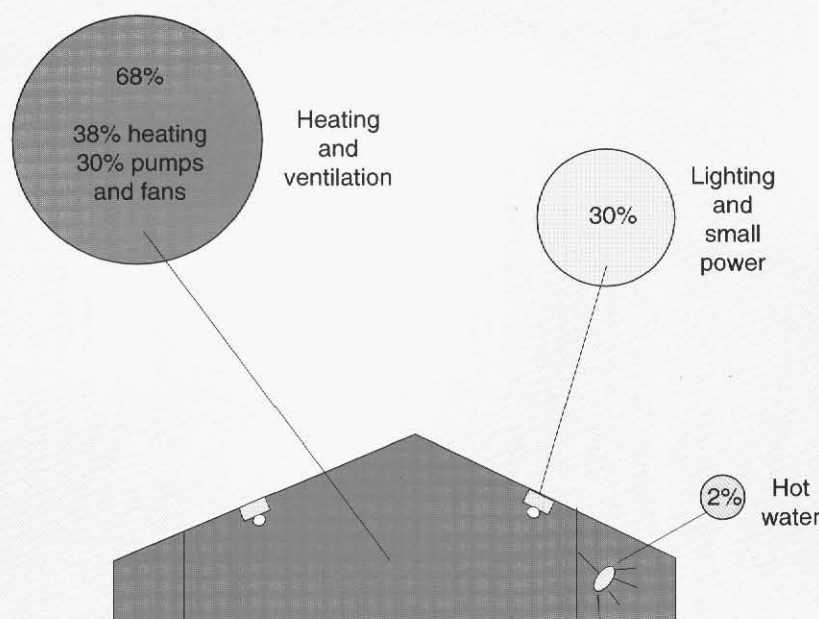
Ventilating the pool is becoming increasingly significant due to the recent trend towards larger pools incorporating wave machines, water canons, whirlpools, water slides, spa pools and portions of indoor pools actually being outdoors. All these features increase evaporation rates and hence the ventilation requirements necessary to maintain acceptable humidity levels (less than 65%).

Combined heat and power (CHP) is a special case in that it enables you to satisfy your energy needs for a lower cost by producing heat and electricity on site from a relatively cheap energy source. CHP is particularly well suited for sports and recreation centres with swimming pools because of their simultaneous demand for heat and electricity throughout the year. Examples of CHP installations are described in Good Practice Case Studies 280 and 281.

Whenever replacement of major items of plant is being considered, a full option appraisal should be undertaken. Details of how to conduct an option appraisal are given in Good Practice Guide 182*.

Breakdown of energy costs in a typical dry sports centre

The foundation of any energy policy is to know how much energy is being used and how much it costs. This diagram shows the distribution of energy costs in a typical dry sports centre.



Tariff analysis

This Guide mainly concerns the management and efficient use of energy rather than the price at which energy is purchased. However, energy tariffs are important, and valuable savings can be made by selecting the best tariff and fuel supplier.

Electricity users who have maximum demand in excess of 100 kW can negotiate with suppliers other than their Regional Electricity Company (REC) for the most economical electrical unit cost. (All users will be able to do this from April 1998). Many sports and leisure centres have maximum demand ratings in excess of 100 kW.

There is a variety of tariff structures available from your REC, whose staff will help you to choose the most economical structure to suit your pattern of usage and requirements.

There are also alternatives available for the purchase of gas. Consumers with annual consumption over 73 000 kWh can purchase their gas from independent suppliers. This option will be available to all consumers from April 1996. British Gas publishes a document relating to national tariff structures and tariff charges are graded for these consumers. British Gas can be contacted for further details. For other gas suppliers contact OFGAS.

You can also get expert help from the energy supply companies and independent consultants.

The energy management route

IDENTIFYING OPPORTUNITIES

There are two ways of reducing the amount of money that you spend on energy. The first is by reducing the amount of energy that you use unnecessarily, and the second is by choosing a more economical fuel type and/or tariff structure.

In order to determine the opportunities for reducing energy consumption, an energy survey (an analysis of control and flow of energy), or an audit (a study of energy cost and use), may be conducted. This involves analysing past fuel bills, and assessing current practices by means of a simple walk-round. Guidelines can be found in the DOE guide 'Energy audits in buildings'. Another DOE publication, 'Introduction to energy efficiency in sports and recreation centres', shows how to identify simple opportunities for energy saving without going for a comprehensive audit.

A more detailed survey, involving monitoring of specific plant and equipment, may also be worthwhile. This will show how energy is used, and will help to identify plant that is wasting energy. As a result of the survey, an action plan can be drawn up. This might include a commitment to:

- establish ongoing monitoring procedures
- develop staff awareness and motivation, in order to promote and maintain effective housekeeping practices
- planned preventive maintenance, in order to derive the maximum benefit from both new and existing plant
- replace worn out or inefficient plant with energy efficient plant and equipment.

Detailed guidance can be found in CIBSE Applications Manual 5 – Energy audits and surveys.

IMPLEMENTATION

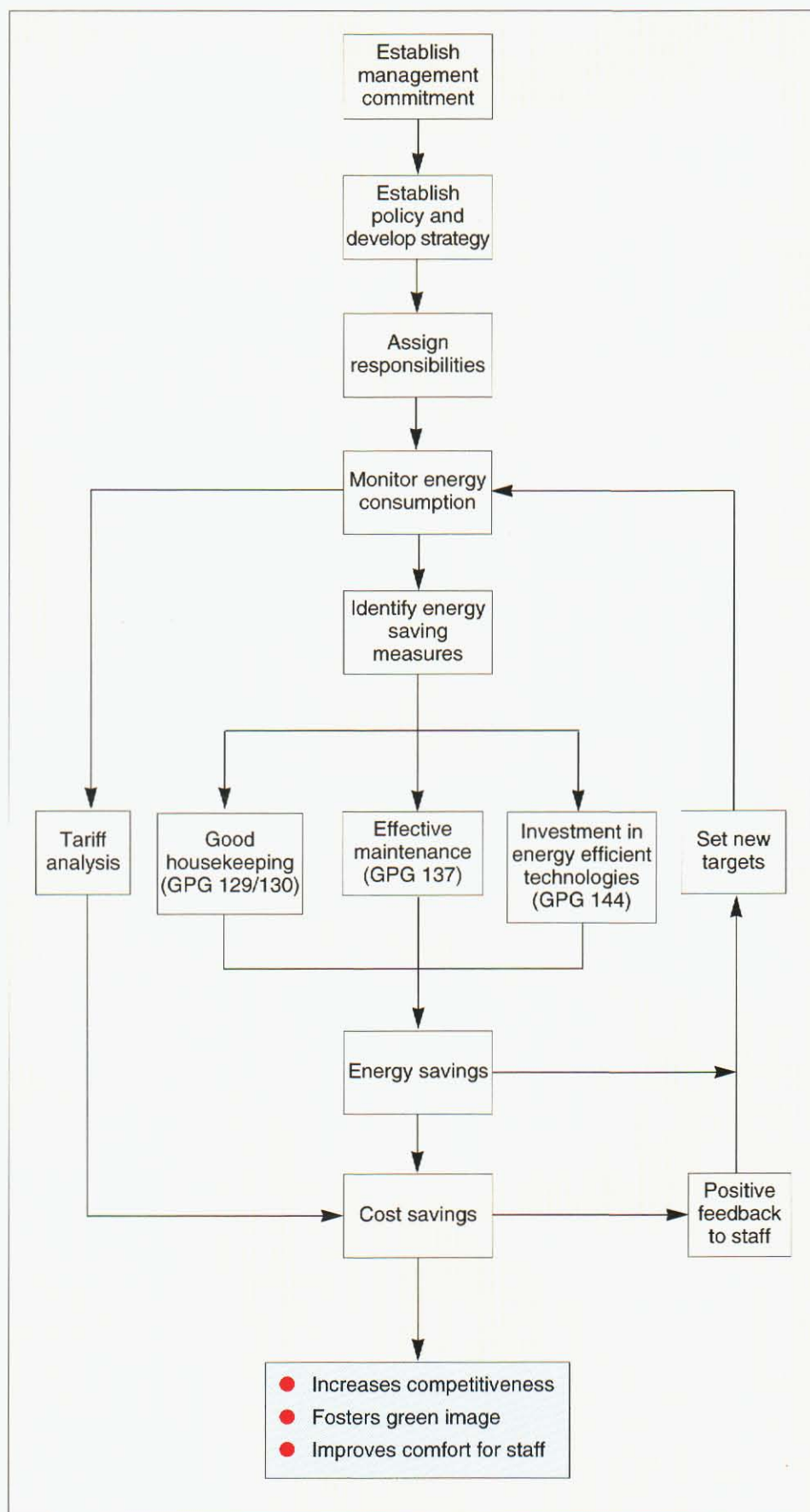
Monitoring consumption

Monitoring identifies what savings have been achieved. This information provides the basis for progress reports, which should be regularly delivered to all staff. It also:

- highlights poor or deteriorating performance
- enables targets to be set
- provides useful data for tariff negotiation
- helps justify new projects by enabling progress to be reported to management.

Good housekeeping

Good housekeeping activities are an important component of an energy management strategy. Good housekeeping refers to a range of activities that involve virtually no cost, but which can reduce present and future energy consumption, and improve comfort. Further details can be found in Good Practice Guides 129 and 130.

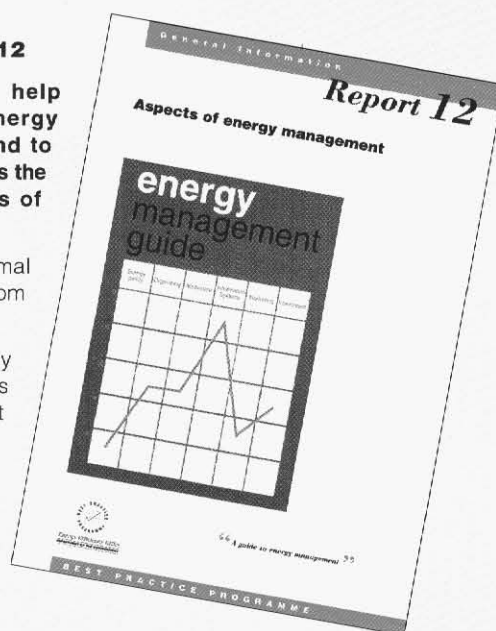


The energy management route

GENERAL INFORMATION REPORT 12

The purpose of this Guide is to help you assess the current state of energy management in your organisation and to help you decide what to do next. It covers the following key organisational aspects of energy management:

- **Energy policy:** why you need a formal commitment to energy management from your organisation.
- **Organising:** how to integrate energy management into your organisation's formal and informal management structure.
- **Motivation:** how to build effective relations with energy users and motivate them to conserve energy.
- **Information systems:** what is an appropriate and effective information system.
- **Marketing:** where and how to promote and publicise energy management and your achievements.
- **Investment:** how to identify projects and justify investment in increased energy efficiency and how to demonstrate value for money to top management.



USEFUL ADDRESSES

Chartered Institution of Building Services Engineers (CIBSE)

Delta House
222 Balham High Road
London SW12 9BS
0181 675 5211

Energy Systems Trade Association Limited (ESTA)

PO Box 16
Stroud
Gloucestershire GL6 9YB
01453 886 776

The Sports Council

16 Upper Woburn Place
London WC1H 0QP
0171 388 1277

Institute of Leisure and Amenity Management (ILAM)

ILAM House
Lower Basildon
Reading
Berkshire RG8 9NE
01491 874 222

Institute of Sports and Recreation Management (ISRM)

36/38 Sherrard Street
Melton Mowbray LE13 1XJ
01664 65531

FURTHER INFORMATION

DOE Energy Efficiency Best Practice publications:

Introduction to Energy Efficiency in Sports and Recreation Centres

Good Practice Guides

- 129** Good housekeeping in dry sports centres
- 130** Good housekeeping in swimming pools – a guide for centre managers
- 137** Energy efficiency in sports and recreation buildings: effective plant maintenance
- 144** Energy efficiency in sports and recreation buildings: technology overview

Good Practice Case Studies

- 43** Energy efficiency in sports and recreation buildings: condensing gas boilers
- 76** Energy efficiency in sports and recreation buildings: swimming pool covers
- 219** Two-speed motors on ventilation fans
- 280** Energy efficiency in sports and recreation buildings: CHP – the 'capital purchase' option
- 281** Energy efficiency in sports and recreation buildings: CHP – the 'supplier financed' option

DOE Making a Corporate Commitment:

Chairman's Checklist
Executive Action Plan

CIBSE Applications Manual 5 Energy Audits and Surveys, available from the Chartered Institution of Building Services Engineers (address in panel above)

The Sports Council (address in panel above) publish the following:

- Ref no: 382 Sports halls, heating and ventilation
- Ref no: 383 Sports halls – lighting
- Ref no: 387 Swimming pools – building services
- Handbook of sports and recreational buildings design:
 - Volume 2 Indoor sports
 - Volume 3 Ice rinks and swimming pools

The following DOE Energy Efficiency Best Practice programme documents in preparation will be sent to those on the BRECSU mailing list when they become available:

- *Energy Consumption Guide 51 Energy efficiency in sports and recreation buildings: a guide for owners and energy managers.
- *Good Practice Guide 182 Heating system option appraisal – a manager's guide
- *Good Practice Guide 186 Developing an effective energy policy